

**SUPPRESSION OF THE NAME CAMPOLETIS PERDISTINCTA  
(HYMENOPTERA: ICHNEUMONIDAE) AND THE IDENTITY OF  
SPECIES TO WHICH THE NAME HAS BEEN APPLIED<sup>1</sup>**

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INTRODUCTION

The name *Campoletis perdistincta* (Viereck) has recently appeared rather frequently in the literature, apparently most often as a mis-identification of *Campoletis sonorensis* (Cameron), an important parasite of both *Heliothis zea* (Bod.) and *H. virescens* (F.). Townes and Townes (1966) referred *sonorensis* to the genus *Campoletis*, but the name has never been associated with specimens other than the holotype. It is doubly unfortunate that the name *C. perdistincta* is a junior synonym of *Campoletis flavicineta* (Ashmead). While *C. flavicineta* has often been reared from *Heliothis zea*, it seems to parasitize *H. virescens* very infrequently. The taxonomic results of my research on the identity of *C. perdistincta*, which included the study of pertinent type specimens, are summarized below.

***Campoletis flavicineta* (Ashmead)**

*Limneria flavicineta* Ashmead (1890, p. 436). Lectotype here designated as the male labeled as lectotype by me in 1971, bearing Webster no. 243, and USNM type no. 2085; reared at Lafayette, Indiana, and deposited in the U. S. National Museum.

*Amorphota nocturna* Viereck (1905, p. 308). NEW SYNONYMY.

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Holotype a male collected at Lawrence, Kansas; deposited at the University of Kansas.

*Limmerium perdistinctus* Viereck (1905, p. 304). NEW SYNONYMY. Holotype a female collected in Douglas County, Kansas; deposited at the University of Kansas.

*Limmerium (Campoletis) prodeniae* Viereck (1911, p. 190). Synonymized by Townes (1945). Lectotype here designated as the female labeled as lectotype by me in 1971, bearing Viereck's type label, USNM type no. 13483, and data labels reading "Mt. Washington, Ohio; bred from *Prodenia* [i.e. *Spodoptera ornithogalli* (Guen.)]; Aug. 21, 09; H. M. Miller Coll.," and deposited in the U. S. National Museum.

*Sagaritis modestus* Viereck (1925, p. 201; 1926, p. 75). NEW SYNONYMY. Holotype a male collected at Grimsby, Ontario; deposited in the Canadian National Collection.

*Sagaritis trochanteralis* Viereck (1925, p. 199; 1926, p. 75). NEW SYNONYMY. Holotype a female collected at Ottawa, Ontario; deposited in the Canadian National Collection.

*Sagaritis twinni* Viereck (1925, p. 200; 1926, p. 72). NEW SYNONYMY. Holotype a female collected at Ottawa, Ontario; deposited in the Canadian National Collection.

#### *Campoletis sonorensis* (Cameron)

*Limmeria sonorensis* Cameron (1886, p. 307). Holotype a female collected in Sonora, Mexico; deposited in the British Museum.

*Limmerium (Angitia) websteri* Viereck (1910, p. 382). NEW SYNONYMY. Holotype a female reared from *Autographa californica* (Speyer) at Pullman, Washington; deposited in the U. S. National Museum.

#### *Campoletis julia* (Viereck), NEW COMBINATION

*Sagaritis julius* Viereck (1925, p. 200; 1926, p. 125). Incorrectly suppressed as a synonym of *Limmerium (Angitia) websteri* Viereck by Townes (1945). Holotype a male reared from "*Choreutis [balsamorrhizella* Buseck] on *Balsamorhiza*" at Waterton Lakes, Alberta; deposited in the Canadian National Collection.

Although *Campoletis julia* will not be discussed in the remainder of this paper, it is necessary to mention the species because the name has been incorrectly suppressed since 1945 as a synonym of *C. websteri*, the latter being suppressed here as a synonym of *C. sonorensis*. In the collection of the U. S. National Museum there are two males and a female of *C. julia* reared from larvae of *Choreutis balsamorhizella* which were collected at Emigrant Lake (Jackson County), Oregon. They agree well with the *C. julia* holotype, which was reared from the same host. In *C. julia* the temples are more robust than in *C. sonorensis*, but the two species are rather similar in coloration. Although *C. julia* and *C. sonorensis* appear to be rather closely related, their habitats apparently are very different.

The situation leading to the partial misidentification of *Campoletis perdistincta* actually began with the misidentification of *Mesoleptus dubitatus* Cresson. *M. dubitatus* is a junior synonym of *Campoletis argentifrons* (Cresson), and this species is actually very distinct from the other species discussed in this paper. Preceding synonymization with *argentifrons* by Townes (1945), nearly all applications of the name *dubitatus* and its replacement name, *Linnerium provancheri* Dalla Torre<sup>3</sup>, were misidentifications of a number of species including *flavicincta* and *sonorensis*. Although Townes (1945) must have realized this, he nevertheless made no remarks to that effect in listing under *C. argentifrons* all the literature (and host records therein) that cited the names *dubitatus* and *provancheri*. Townes and Townes (1945) attempted to rectify that situation by referring all the hosts recorded under *C. argentifrons* by Townes (1945) to *C. perdistincta* instead, perhaps not realizing that they were attributing to one species the host records of *C. argentifrons*, *C. flavicincta*, *C. sonorensis*, and probably other species. It appears that taxonomists subsequently determining specimens as *C. perdistincta* placed too much importance on host identity and devoted too little time to the careful study of the specimens being identified, thus perpetuating the confusion.

Added confusion has resulted from application of the name *perdistincta* to a *Campoletis* sp. reared in India from *Heliothis armigera* Hübn. (see Gangrade, 1964). This Asian species is probably undescribed, but in any case is distinct from either *C. flavicincta* or *C. sonorensis*.

<sup>3</sup>Prior to 1945, the name *dubitatus* and *provancheri* were most frequently combined binomially with *Sagaritis*, a preoccupied synonym of *Campoletis*.

## HOST RECORDS AND HABITATS

In the collection of the U. S. National Museum there are specimens bearing many of the host records listed for *C. argentifrons* by Townes (1945) and for *C. perdistincta* by Townes and Townes (1951), which makes it possible for me to partially correct those lists of hosts. A few of the following host records are new, however.

I have seen specimens of *C. argentifrons* that were reared from the pyralid *Crambus matabilis* Clem. and the noctuids *Agrotis ipsilon* (Hufn.), *Anicla infecta* (Oehs.), and *Lacinipolia renigera* (Steph.). I have not seen more than several specimens reared from any of these hosts, and it is therefore possible that these four species are merely incidental hosts for *C. argentifrons*.

*C. sonorensis* has been reared from the pierid *Anthocharis midea* (Hüb.) and the following Noctuidae: *Autographa californica*, *Heliothis phloxiphaga* (G. & R.), *H. virescens*, *H. zea*, *Peridroma saucia* (Hüb.), *Spodoptera exigua* (Hüb.), and *Trichopulsia ni* (Hüb.). Of these, *Autographa californica*, *Heliothis virescens*, and *H. zea* appear to be important hosts for *C. sonorensis*. Specimens bearing host plant records indicate that *C. sonorensis* frequents fields of cotton, tobacco, alfalfa, and tomatoes.

*C. sonorensis* and *C. flavicincta* share at least three hosts, *Heliothis virescens*, *H. zea*, and *Trichopulsia ni*. Neither parasite is frequently reared from *T. ni*, and *H. virescens* is very infrequently a host for *C. flavicincta*. *H. zea*, however, can be heavily parasitized by both *C. flavicincta* and *C. sonorensis*. However, there seems to be scarcely any intermingling of the two parasites on a single host plant, and this probably explains the apparent post-1940 prevalence of *C. sonorensis* over *C. flavicincta* in rearings from *H. zea*. Corn (*Zea mays*) was the host plant involved in much of the earlier research on *H. zea*, while more recent research on *H. zea* (particularly that done in the vicinity of Brownsville, Texas) has concerned its role as a pest of cotton.

In addition to the three hosts it shares with *C. sonorensis*, *C. flavicincta* has been reared from *Pieris rapae* (L.), the pyralids *Ostrinia nubilalis* (Hüb.) and *Udea rubigalis* (Guén.), and the following Noctuidae: *Agrotis ipsilon*, *Dargida procincta* (Grt.), *Lacinipolia stricta* (Wlk.), *Pseudaletia unipuncta* (Haw.), *Spodoptera eridania* (Cram.), *S. frugiperda* (J. E. Smith), and *S. ornithogalli*. *Heliothis zea*, *Spo-*

*dooptera frugiperda*, and *S. ornithogalli* are important hosts for *C. flavicineta*, and the same may be true of *S. eridania* and *Pseudaletia unipuncta*.

It is apparent that *C. flavicineta* is a frequent inhabitant of corn fields, but from its host records little else can be ascertained with certainty about the kinds of habitats in which *C. flavicineta* is likely to occur. Among a group of *C. flavicineta* specimens from Florida, several were reared from cocoons collected on each of the host plants, cotton and celery, and one emerged from a cocoon found on *Amaranthus* sp. The lectotype and paralectotype of *C. flavicineta* bear Webster no. 243, and the card in the Webster file at the U. S. National Museum indicates that these specimens were reared from *Spodoptera frugiperda* on wheat.

#### GEOGRAPHIC DISTRIBUTION

Both *C. flavicineta* and *C. sonorensis* have extensive ranges, but that of *C. flavicineta* may be larger. I have seen specimens of *C. flavicineta* from as far south at Montevideo, Uruguay, and as far north as Toronto, Ontario, and Cowichan Bay (Vancouver Island), British Columbia. Sandpoint, Idaho, is the northernmost point of distribution known to me for *C. sonorensis*. At longitudes east of the Rocky Mountains, however, *C. sonorensis* does not appear to range nearly that far north: at their respective longitudes, Bellvue, Colorado, Anna, Illinois, and Greene County, Tennessee, are the most northerly points from which I have seen specimens of *C. sonorensis*. The southernmost locality from which I have seen specimens of *C. sonorensis* is Lima, Peru.

#### CHARACTERS DIFFERENTIATING *C. FLAVICINETA* AND *C. SONORENSIS*

Although *C. flavicineta* and *C. sonorensis* do not appear to be closely related, it seems worthwhile to give a few adult differences because both species can heavily parasitize *Heliothis zea*. The males of the two species tend to differ in the same ways as do females, but in the males, the differences are much more subtle. For that reason, the specific differences given below are those of the more highly specialized females.

The hind tibia provides the only obvious differences in coloration.

In *C. sonorensis* the hind tibia has rather discrete areas of dark and light coloration. The median dorsal portion of the hind tibia is white, and the blackish basal band of the tibia is connected by a narrow ferruginous or fuscous ventral stripe to the apical dark portion. This apical portion is ventrally concolorous with the stripe, but becomes fuscous or blackish dorsally.

The zones of light and dark coloration on the hind tibia of *C. flavicineta*, however, are rather indiscrete. In most North American specimens the median dorsal portion of the hind tibia is more or less stramineous. The basal and dorso-apical portions are ferruginous and are connected by an indiscrete ventral stripe of paler ferruginous coloration. In most South American specimens of *C. flavicineta* that I have seen, the hind tibia tends to be more melanic, and, in addition to the ventral stripe, has a more or less distinct dorsal fuscous stripe connecting its dark basal and apical portions.

To the untrained eye, the structural differences between *C. flavicineta* and *C. sonorensis* will probably seem subtle. Nevertheless, the two species are comparative rather dissimilar in structure. Both have relatives with which they agree much more closely in structure than they do with each other.

There are a number of species differences in head structure. (1) In females of *C. flavicineta*, the median field of the face is very weakly raised, so that the face is nearly flat. Females of *C. sonorensis*, on the other hand, have the median 1/3 to 1/4 of the face distinctly convex. (2) The clypeus of *C. flavicineta* is more nearly truncate than that of *C. sonorensis*, the clypeal apex of the latter describing a curve that is more nearly semicircular. (3) In *C. flavicineta* the gena and the lower 2/3 of the temple curve mesad very abruptly near their hind margins. In *C. sonorensis* the temple and gena are more uniformly convex, so that the mesad curvature at their posterior margins is not nearly so abrupt as in *C. flavicineta*.

Other structural differences between *C. sonorensis* and *C. flavicineta* females are to be found in the petiolar area of the propodeum and in the ovipositor. In *C. sonorensis* the petiolar area of the propodeum is usually distinctly concave, but in *C. flavicineta* the concavity of the petiolar area usually is scarcely discernible. The ovipositor of *C. flavicineta* is somewhat more strongly compressed laterally and somewhat more strongly upcurved than that of *C. sonorensis*.

## CONCLUSION

It is hoped that this paper will stimulate interest in additional biological studies of *C. sonorensis* and *C. flavicincta*. Research on the habitat preferences of the two species is particularly needed. Without it, one will have difficulty in determining the significance of laboratory studies like that of Lingren et al. (1970) on the host preferences of *C. sonorensis*.

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**2.0145 Suppression of the name *Campoletis perdistincta* (Hymenoptera: Ichneumonidae) and the identity of species to which the name has been applied.**

ABSTRACT.—*Campoletis perdistincta* (Viereck) is a junior synonym of *C. flavicincta* (Ashmead). The name *C. perdistincta* was applied most often as a misidentification of *C. sonorensis* (Cameron), the latter name suppressing its junior synonym, *C. websteri* (Viereck). *C. julia* (Viereck) is a species distinct from *C. sonorensis* and was incorrectly suppressed as a synonym of *C. websteri*. The Asian parasite of *Heliothis armigera* Hüb., misdetermined as *C. perdistincta*, is distinct from both *C. sonorensis* and *C. flavicincta*. The hosts, ranges, and differentiating characters of *C. sonorensis* and *C. flavicincta* are discussed.—ROBERT W. CARLSON, Systematic Entomology Laboratory, USDA, c/o U. S. National Museum of Natural History, Washington, D. C. 20560.

*Descriptors:* Hymenoptera; Ichneumonidae; *Campoletis flavicincta*; *Campoletis julia*; *Campoletis perdistincta*; *Campoletis sonorensis*; *Campoletis websteri*; synonymy; hosts; ranges; differentiating character; *Heliothis armigera*.